

Voltage Monitor

Paul Goosens

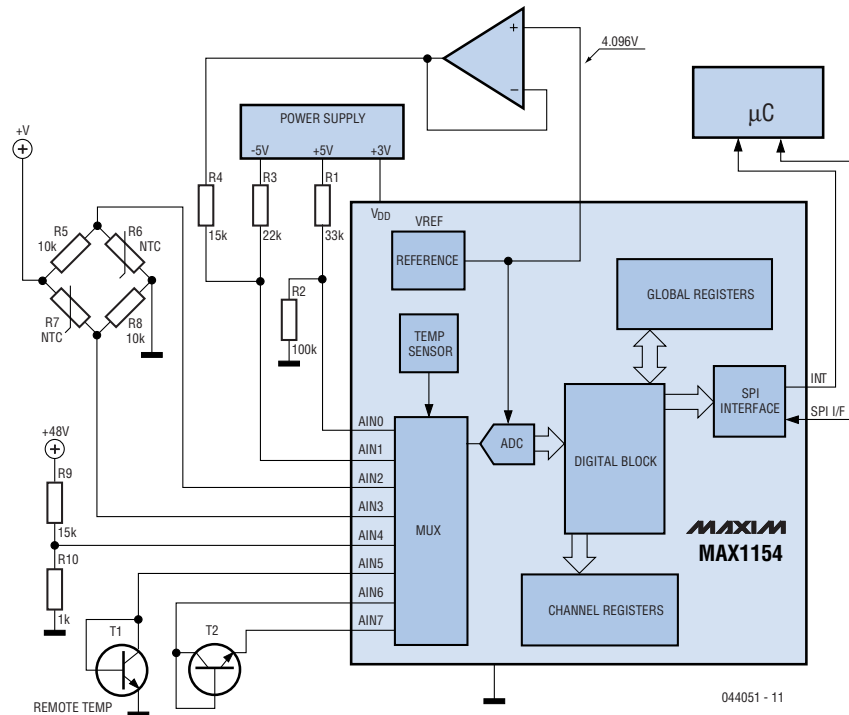
It is often necessary to monitor the power supply voltage in a piece of equipment. When the device takes its power from a battery, the input voltage can change and provide an indication of how much energy is left. Even a device powered from the mains can benefit from keeping an eye on the (various) power supply voltages in the circuit and take the necessary steps in the event of a fault condition.

If a slightly intelligent reaction is required for this situation, it is obvious to do this with a microcontroller. This requires the microcontroller to periodically measure the voltages with one or more A/D converters and decide whether the values are correct or whether something is the matter.

This naturally costs processor time and makes the firmware a little more complicated. This can become a problem, particularly when other functions have to be carried out on a regular basis as well.

Fortunately, chip manufacturer Maxim has a number of ICs in its line-up specifically for this purpose. These ICs all have as task to monitor a number of voltages and when these do not conform to certain requirements the IC generates an interrupt, which indicates to the microcontroller that something has gone wrong.

The MAX1153 and MAX1154 are provided with a 10-bit ADC, while the MAX1253 and MAX1254 are provided with a 12-bit ADC. All these ICs are capable of monitoring 8 external voltages and



2 internal voltages. These 8 external voltages can also be programmed for temperature sensors, where an external diode can be used as a simple and cheap sensor.

For each channel, a maximum and minimum voltage or temperature can be specified. As soon as the input voltage or temperature falls outside this range the interrupt output goes low. If desired, a glitch suppressor can be individually configured for each channel. A recursive averaging

filter is also available and it is even possible to specify how many successive samples have to be outside the range before the interrupt is generated. The sample-rate of the ADC is also adjustable, to a maximum of 90 ksamples/s.

The SPI bus serves as interface to the controller and requires only four signals to communicate. For more information you can visit the Maxim website:

www.maxim-ic.com